PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor:	Lewin, et al.	Atty.Dkt.No.:	5957-48401
Serial Number:	10/654,619	Examiner:	Nguyen, Van Kim T.
Filing Date:	September 3, 2003	Group/Art Unit:	2456
Title:	System for Transporting Ethernet Frames over Very High Speed Digital Subscriber Lines	Conf. No.:	4999

REQUEST FOR PREAPPEAL BRIEF REVIEW

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Applicants request review of the final rejection in the above-identified application. No amendments are being filed with this request. This request is being filed with a notice of appeal. Independent claims 8, 10, 38, 48, and 53 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Terry, U.S. Patent No. 6,178,161 ("Terry") in view of Locklear, Jr. et al., U.S. Patent No. 5,999,565 ("Locklear"). Applicants set forth the clear errors in the rejections below. Please note that for brevity, only the primary arguments directed mainly to the independent claims are presented, and that additional arguments, e.g., directed to the subject matter of the dependent claims, will be presented if and when the case proceeds to Appeal. Applicants note that there is also an obviousness-type double patenting rejection in the Final Office Action. Applicants submit herewith a Terminal Disclaimer overcoming that rejection.

Applicants respectfully submit that claims 8-11 and 30-56 recite combinations of features not taught or suggested in the cited art. For example, claim 8 recites a combination of features including: "encapsulating … Ethernet frames within a plurality

of frames, wherein each Ethernet frame is encapsulated entirely within a respective frame of the plurality of frames … and transmitting said plurality of frames over said VDSL facility."

As explained in detail below, the proposed combination of Terry and Locklear (even assuming a motivation to combine) would not include transmitting a plurality of frames over a VDSL facility, where each received Ethernet frame is "encapsulated entirely within a respective frame of the plurality of frames," as recited in claim 8. Notably, **Locklear's mechanism for transmission of data received from Ethernet on VDSL includes decapsulating the packet (e.g. an IP packet) from the Ethernet frame and passing the IP packet to the VDSL hardware for VDSL encapsulation and transmission**. Accordingly, Ethernet frames are not encapsulated in VDSL frames in Locklear. Locklear's decapsulation and encapsulation is completely different from encapsulating Ethernet frames in ECAP frames, as taught by Terry. Furthermore, Terry's teachings regarding encapsulating Ethernet frames in ECAP frames cannot be used with fixed length VDSL frames.

Locklear Does not Teach Encapsulating Ethernet Frames in VDSL Frames

Locklear teaches processing Ethernet frames in an IP stack to obtain the IP packet from the Ethernet frame, and encapsulating the IP packet in one or more VDSL frames for transmission on the VDSL interface. Specifically, Ethernet frames are received by the interface 68 in Fig. 2, and are provided to the router 52. The router 52 includes protocol stacks 56 and 57, through which received Ethernet frames are processed and XDSL frames are generated. The protocol stack 57 strips away the Ethernet frame data to arrive at the underlying IP packet, which is then provided to the IP layer of the stack 56. The stack 56 packages the IP packet as one or more VDSL frames for transmission on VDSL.

For example, see Locklear, col. 6, lines 4-10: "Router 52 couples data lines 54 from modems 50 to a series of protocol layers. Protocol layers are arranged in a first stack 56 associated with XDSL communications and a second stack 57 associated with

LAN communications. Router 52 performs open systems interconnect (OSI) model processing by passing data through protocol layers associated with stacks 56 and 57."

At col. 6, lines 13-25, Locklear teaches: "Lines 54 couple to a first physical layer 58, such as an ADSL physical layer, which in turn couples to an intermediate protocol layer 60, such as a multilink point-to-point protocol (PPP). A common protocol layer 62, such as an Internet Protocol (IP) layer, provides a common protocol between first stack 56 and second stack 57. Common protocol layer 62 in second stack 57 couples to an intermediate protocol layer 64, such as a media access controller (MAC) layer. Intermediate protocol layer 64 couples to a second physical layer 66, such as an Ethernet physical layer, which in turn couples to an interface 68 using line 70."

At col. 6, line 60-col. 7, line 1, Locklear teaches: "In operation, device 12 receives inbound or downstream data associated with a session on one or more modems 50 coupled to twisted pair lines 22, **passes the data through protocol layers of router 52,** and communicates the data through interface 68 to LAN 18. Device 12 also receives outbound or upstream data associated with the session from LAN 18 through interface 68, passes the data through protocol layers of router 52, and communicates the data through one or more modems 50 to twisted pair lines 22."

In the above highlighted sections, Locklear clearly teaches that all XDSL traffic passes through the XDSL protocol layers up to the IP layer, and then down from the IP layer through the Ethernet protocol layers to the Ethernet interface. Similarly, all Ethernet traffic passes through the Ethernet protocol layers to the IP layer, then down through the XDSL protocol layers to the XDSL modems. The common layer is the IP layer, at which the IP packet exists and all XDSL or Ethernet protocol data has been removed. Therefore, while Locklear does teach transmitting data received from Ethernet on XDSL (and vice versa), there is no encapsulation of the Ethernet frame in the XDSL frame. Instead, the data is processed by the respective protocol stacks and all vestiges of one frame are erased prior to encapsulating the IP packet in the other frame.

Fixed-Size VDSL Frames Cannot Accommodate Ethernet Frames

Terry teaches encapsulating an Ethernet frame within an Ethernet Collision Avoidance Protocol (ECAP) frame (an "ECAP" frame is a term that is defined by Terry, as opposed to an industry standard definition). See, for example, Fig. 2 of Terry. Notably, Terry's ECAP frame is large enough to encapsulate an Ethernet frame, since the ECAP frame is defined by Terry to be a frame that includes the encapsulated Ethernet frame, preceded by overhead (O/H in Fig. 2) and followed by a check sequence (CHK in Fig. 2). In contrast, VDSL frames (as taught in Locklear) are **fixed-size frames** defined by the VDSL standard.

Terry's teachings regarding ECAP frames include: "FIG. 2 illustrates one example of an ECAP data frame, comprising overhead information O/H, followed by a single Ethernet frame having the known form described below, followed by a check sequence CHK." (Terry, col. 6, lines 40-43) Terry goes on to teach that the "O/H field at the start of the ECAP frame for example consists of a few bytes comprising a preamble and start-of-frame (SOF) indication of a suitable form for the modulation method in use by the modems 12 and 14, possibly followed by other information such as an ECAP frame sequence number for frame identification in known manner (e.g. for identifying frames for acknowledgement or retransmission). The check sequence CHK at the end of the ECAP frame conveniently comprises a CRC sequence which can be produced in exactly the same manner as the FCS field of the Ethernet frame, the CRC operating on all of the information in the ECAP frame following the SOF indication up to and including the FCS at the end of the Ethernet frame." (Terry, col. 7, lines 13-25). Accordingly, Terry's ECAP frames are **variable length frames** based on the encapsulated Ethernet frame size. One cannot simply add Locklear's teachings of fixed-size VDSL frames to the teachings of Terry to arrive at the features of claim 8 without violating the VDSL specification. The VDSL modems in Locklear would fail to function correctly if the encapsulation of Terry were used, since at least some VDSL frames would be larger than the VDSL standard permits. For similar reasons, Terry's ECAP packets cannot be transmitted on VDSL without causing the VDSL hardware to malfunction. As known to one of ordinary skill in the art, the VDSL modems rely on the VDSL specification to

communicate and thus expect fixed-length frames at regular intervals, not variable length frames as taught by Terry. The teachings of Terry and Locklear are simply incompatible. The fact that Locklear teaches transmitting data between Ethernet and VDSL, combined with Terry's ECAP teachings, does not lead one to a system in which each Ethernet frame is encapsulated in a frame transmitted on VDSL.

For at least the above stated reasons, Applicants submit that claim 8 is patentable over the cited art. Independent claims 10, 38, 48, and 53 recite combinations of features including features in which an Ethernet frame is encapsulated in a first frame and transmitted or received over a VDSL facility. Thus, independent claims 10, 38, 48, and 53 are patentable over the cited art as well.

CONCLUSION

Applicants submit the application is in condition for allowance, and an early notice to that effect is requested. If any extensions of time (under 37 C.F.R. § 1.136) are necessary to prevent the above referenced application(s) from becoming abandoned, Applicant(s) hereby petition for such extensions. If any fees are due, the Commissioner is authorized to charge said fees to Meyertons, Hood, Kivlin, Kowert, & Goetzel, P.C. Deposit Account No. 501505/5957-48401/LJM.

Respectfully submitted,

/Lawrence J. Merkel/
Lawrence J. Merkel, Reg. No. 41,191
AGENT FOR APPLICANT(S)

Meyertons, Hood, Kivlin, Kowert, & Goetzel, P.C.
P.O. Box 398
Austin, TX 78767-0398
Phone: (512) 853-8800

Date: April 13, 2009